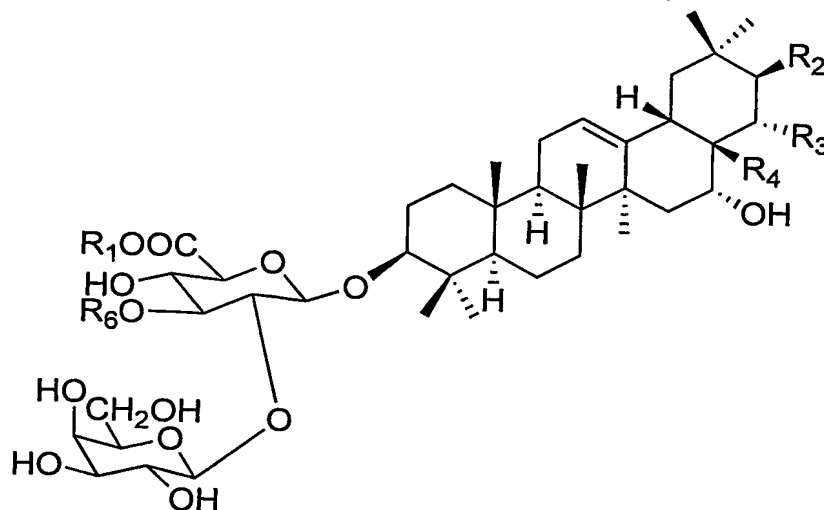


glycoside fraction was different to that produced by narcotics.

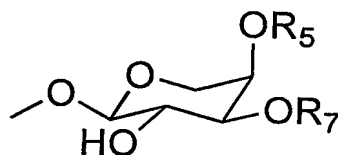
SUMMARY OF THE INVENTION

One aspect of the invention, and by no means the broadest form, provides for novel compounds of the formula (I)



wherein:

R₂ is selected from hydrogen, hydroxyl, O-alkyl, O-alkenyl, O-benzoyl, O-alkanoyl, O-alkenoyl, O-aryl, O-heterocyclic, O-heteroaryl or

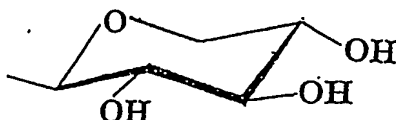


wherein R₅ and R₇ are independently be selected from hydrogen, alkanoyl, alkenoyl, benzoyl or benzoyl alkyl substituted alkanoyl;

R₃ is selected from hydroxyl, O-alkanoyl, O-alkenoyl, O-benzoyl, O-alkyl, O-alkenyl, O-aryl, O-heterocyclic or O-heteroaryl;

R₄ is selected from -CH₂OH, COOH, CH₂OCOCH₃, COO alkyl, COO aryl, CH₂COO alkyl, COO-heterocyclic, COO-heteroaryl, CH₂-O aryl, CH₂O heterocyclic or CH₂O heteroaryl;

R₆ is selected from hydrogen or



R₁ is selected from hydrogen or alkyl; or
pharmaceutically acceptable salts thereof, with the provisos that when:
R₂ is OH, R₃ is OH, R₄ is CH₂OH, and R₆ is xylopyranosyl, R₁ is not H;
R₄ is CH₂OH and R₃ is O-alkanoyl R₂ is not O-acetyl; :
5 R₄ is CH₂OH and R₂ is O-alkenoyl R₃ is not hydroxyl; and
R₄ is CH₂OH and R₃ is hydroxyl then R₂ is not hydroxyl.

The term "alkyl" refers to linear, branched, cyclic and bicyclic structures and combinations thereof, having 1 to 18 carbon atoms. Non-limiting examples of alkyl groups include methyl, ethyl, propyl, isopropyl,
10 butyl, s- and t-butyl, pentyl, hexyl, heptyl, octyl, nonyl, undecyl, dodecyl, tridecyl, tetradecyl, pentadecyl, cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl and the like. More preferably alkyl is selected from methyl, ethyl, propyl, isopropyl, butyl, s- and t-butyl, pentyl, and hexyl.

The term "alkenyl" refers to unsaturated linear or branched structures
15 and combinations thereof, having 1 to 7 carbon atoms. Non-limiting examples of alkenyl groups include, ethenyl, propenyl, isopropenyl, butenyl, s- and t-butenyl, pentenyl, hexenyl.

"Alkanoyl" means alkanoyl groups of a straight or branched configuration having 1-8 carbon atoms. Preferably alkanoyl is selected from
20 acetyl, propionoyl, butyryl, isobutyryl, pentanoyl and hexanoyl. More preferable alkanoyl is selected from acetyl, propionoyl, butyryl, and isobutyryl.

"Alkenoyl" means alkenylcarbonyl in which alkenyl is as defined above. Preferably alkenoyl is selected from pentenoyl, hexenoyl or
25 heptenoyl. More preferably alkenoyl is selected from petnenoyl (tigloyl) or hexenoyl (angeloyl).

The term "benzoyl alkyl substituted alkanoyl" is used to refer to straight or branched C1-C6 alkanoyl substituted with at least one benzoyl and at least one alkyl, wherein the benzoyl is attached to an straight or
30 branched C1-6 alkyl. Preferably a benzoyl alkyl substituted alkanoyl is benzoyl methyl isobutanoyl.

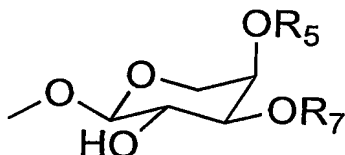
"Heterocyclic" refers to a non-aromatic ring having 1 to 4 heteroatoms

said ring being isolated or fused to a second ring selected from 3- to 7-membered alicyclic ring containing 0 to 4 heteroatoms, aryl and heteroaryl, wherein said heteroatoms are independently selected from O, N and S. Non-limiting examples of heterocyclic include pyrrolidinyl, piperidinyl, piperazinyl, morpholinyl, tetrahydrofuranyl, imidazoliny, thiomorpholinyl, and the like.

"Aryl" means a 6-14 membered carbocyclic aromatic ring system comprising 1-3 benzene rings. If two or more aromatic rings are present, then the rings are fused together, so that adjacent rings share a common bond. Examples include phenyl and naphthyl. The aryl group may be substituted with one or more substituents independently selected from halogen, alkyl or alkoxy.

The term "heteroaryl" as used herein represents a 5-10 membered aromatic ring system containing a single ring having 1-4 heteroatoms, selected from O, S and N. Heteroaryl includes, but is not limited to, furanyl, diazinyl, imidazolyl, isooxazolyl, isothiazolyl, pyridyl, pyrrolyl, thiazolyl, triazinyl and the like.

Preferably R_2 is hydrogen, O-benzoyl, O-tigloyl, or



wherein R_5 and R_7 are selected from hydrogen, tigloyl, benzoyl, or benzoyl alkyl substituted alkanoyl.

Preferably R_3 is selected from hydroxyl, O-acetyl, O-benzoyl, O-isobutyryl or O-tigloyl.

Preferably R_4 is selected from $-CH_2OH$, O-acetyl or hydroxyl.

Preferably the compound of formula (I) is selected from;

- a. 3-O- β -D-xylopyranosyl(1 \rightarrow 3)-[β -D-galactopyranosyl(1 \rightarrow 2)]- β -D-glucuronopyranosyl-21-O-[3-(3-benzoyl-2-methylbutanoyl)-4-benzoyl- α -L-arabinopyranosyl]-22-O-acetyl barringtogenol C;
- b. 3-O- β -D-xylopyranosyl(1 \rightarrow 3)-[β -D-galactopyranosyl(1 \rightarrow 2)]- β -D-glucuronopyranosyl-21-O-benzoyl barringtogenol C;

Aglycones.

Compound F70.2.5.2: - This compound was isolated as 7.2 mg of an amorphous white powder.

5 A compound related to F70.2.5.2, 2 α ,3 β ,19 α -trihydroxy-olean-12-ene-23,28-dioic acid 28-O- β -D-glucopyranoside, was previously isolated from *Barringtonia acutangula* [1]. This compound differs from F70.2.5.2 in that the acid at C₂₈ has a glucopyranoside moiety. Therefore the present compound is 2 α 3 β , 19 α -trihydroxy-olean-12-ene-24, 28-dioic acid (FIG 48).

10 A second aglycone (F70.2.5.3) was isolated in the current project as 1.4 mg of a white substance. The mass of the compound was m/z 485.2912 ($[M - 1]^+$), which is consistent with the molecular formula C₃₀H₄₆O₅ (calculated m/z 486.3345). This suggests the loss of two hydroxyl groups from F70.2.5.2, however insufficient material could be obtained to provide further structural information.

15 **Monodesmosides** - The monodesmosidic compounds described in the following section are grouped according to the functionalities present at C₂₁ and C₂₂ of the aglycone.

Benzoate at C₂₁ and hydroxyl at C₂₂.

20 Compounds F70.2.3.2 and F70.3.2 were shown to have a benzoate moiety at C₂₁ and a hydroxyl group at C₂₂. Both were isolated as amorphous white solids in low yield (8.5 and 26.3 mg respectively).

Benzoate at C₂₁ and *iso*-butyrate C₂₂.

Compound F70.3.4.2 - This compound was isolated as 11.7 mg of an amorphous white powder.

25 **Benzoate at both C₂₁ and C₂₂:** Compounds in this group each had a benzoate functionality at both C₂₁ and C₂₂. Four such compounds were isolated in the current project. Each of the four compounds were isolated as amorphous white substances and the weights were F70.4.3.5.2 (2.7 mg), F70.4.2.4.2 (4.9 mg), F80.6.4 (11.7 mg) and F80.6.7 (3.9 mg).

30 **Benzoate at C₂₁ and tiglate at C₂₂.** - The compounds in this group were characterised by a benzoate at C₂₁ and a tiglate at C₂₂. Four such